UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

Clean Air Act Inspection Report

Drafted: July 18, 2022
Finalized: July 21, 2022

EPA Inspector: Darren Fortescue, Senior Enforcement Coordinator, Air Compliance Section /DEF/
Hannah Patel, Physical Scientist, Air Compliance Section

EPA Reviewer: Elizabeth Kudarauskas, Acting Chief, Air Compliance Section /EAK/

Date of Inspection: July 13, 2022

Facility Name: American GreenFuels, LLC

ICISAir ID#: CT0000000900900925

Facility Location: 30 Waterfront Street, New Haven, CT 06512

Mailing Address: As above

Disclaimer:

Unless otherwise noted, this report describes conditions at the facility/property as observed by EPA inspector(s), and/or through records provided to and/or information reported to EPA inspector(s) by facility representatives and as understood by the inspector(s). This report may not capture all operations or activities ongoing at the time of the inspection. This report does not make final determinations on potential areas of concern. Nothing in this report affects EPA's authorities under federal statutes and regulations to pursue further investigation or action.

Inspection Attendees:

Name	Title	Organization
Darren Fortescue	Senior Enforcement Coordinator	EPA Region 1
Hannah Patel	Clean Air Act Inspector	EPA Region 1
Mark Potash	Engineer	CT DEEP
Alyssa Park	Engineer	CT DEEP
James Grillo	Engineer	CT DEEP
Ming Chai	Plant Manager	American GreenFuels, LLC
Peter Baiardi	Health and Safety and Environment Manager	American GreenFuels, LLC
Elias Petersen	Associate General Counsel	Kolmar Americas, Inc.
Jen McAllen	Senior Vice President	Kolmar Americas, Inc.
Paul Simonetta	Senior Project Manager	Triton Environmental, Inc.

Facility/Process Description:

History

The facility located at 30 Waterfront Street, New Haven, Connecticut was originally owned by Greenleaf Biofuels, LLC ("Greenleaf") and started producing biodiesel on May 20, 2013. At that time Greenleaf worked with the tolling partner Kolmar Americas, Inc. ("Kolmar") to produce biodiesel. Kolmar owned and supplied the feedstock and owned the biodiesel produced at the facility. In turn, Greenleaf owned the plant and was paid a production fee per gallon of biodiesel produced. In addition, Greenleaf owned the glycerin co-product, produced during the production process.

In 2015, Kolmar bought the facility from Greenleaf and renamed the tolling partner to be American GreenFuels, LLC ("AGF").

Biodiesel Production Process

AGF primarily uses waste oil feedstock, which includes waste vegetable oil, yellow grease and animal fat to produce biodiesel. The production process is considered a continuous process.

The feedstock is initially treated using a tricanter and dryer to remove solids and water.

The treated feedstock undergoes an acid esterification ("AE") process in the AE reactor. This process involves adding methanol and sulfuric acid to the treated feedstock and the mixture is

allowed to react. This process is used to convert the free faty acid component of the feedstock into long-chain fatty acid esters, or biodiesel.

The AE treated feedstock then passes through the AE dryer to remove water and methanol from the mixture.

The AE treated feedstock then undergoes a transesterification ("TE") process in two TE reactors operating in series. This process involves adding methanol and sodium methylate to the AE treated feedstock and the mixture is allowed to react. This process is used to convert the remaining feedstock oil into biodiesel and the co-product, glycerin. The glycerin is decanted off after each TE reactor.

The biodiesel product then undergoes a three-step water wash purification process to remove impurities.

The biodiesel passes through a biodiesel dryer and then undergoes a polishing process. The polishing process involves the addition of absorbent diatomaceous earth ("DE") and Sipernat. The biodiesel is then passed through a series of screens that remove absorbed impurities.

Wet Glycerin Processing

The wet glycerin recovered from the process is held in the wet glycerin tank, where it is pH adjusted using sulfuric acid.

The wet glycerin is passed through two glycerin dryers to reduce the water and methanol concentration. The glycerin then passes through the glycerin tricanter. The tricanter recovers free fatty acids from the glycerin to be used as feedstock.

The remaining mixture is 75 to 80 % glycerin that is sold as a by-product.

Methanol Recovery and Emissions Control

The water and methanol recovered from the dryers and the purification system is fed through a distilation column to separate the two constituents. The recovered methanol is reused in the process and the recovered water is reused as wash water or treated and shipped off-site.

The residual methanol vapor from the distilation column is then fed via a vent header to a condenser for further methanol recovery. The vent header also captures emissions from Tanks TK 221, 901, 902, 903 and 904.

The final emissions from the condenser are treated using a Catalytic Combustion, Model SRCO 750G, catalytic thermal oxidizer ("CTO").

Process Boilers

AGF operates three process boilers with 1000, 600 and 200 horsepower capacities.

Number of Employees and Working Hours:

AGF operates 24/7, 365 days per year and employs 47 employees.

Potentially Applicable Clean Air Act Requirements:

40 CFR Part 60, Subpart Kb – Standards of Performance for Volatile Organic Liquids Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984
40 CFR Part 60, Subpart VVa – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006
40 CFR Part 60, Subpart NNN – Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations ("Subpart NNN")
40 CFR Part 60, Subpart RRR – Standards of Performance for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes ("Subpart RRR")
40 CFR Part 63, Subpart EEEE – National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline)
40 CFR Part 63, Subpart FFFF – National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing

Previous Enforcement Actions:

On December 6, 2013, EPA issued Greenleaf a Clean Air Act ("CAA") Notice of Violation. On January 31, 2017, EPA and AGF signed and filed an administrative consent agreement and final order with penalty, settling an administrative enforcement case for violations of CAA New Source Performance Standard regulations. The assessed penalty was $192,000.

Opening Conference:

Entry

On July 13, 2022, at 08:45 am, EPA Region 1 inspectors Darren Fortescue and Hannah Patel met CT DEEP representatives Mark Potash, Alyssa Park and James Grillo. The group proceeded to the AGF facility, located at 30 Waterfront Street, New Haven, Connecticut and met Ming Chai and Peter Baiardi of AGF, Elias Petersen and Jen McAllen of Kolmar and Paul Simonetta of Triton Environmental, Inc. Mr. Fortescue initiated an opening conference.

Mr. Fortescue presented his credentials during the day.

Conference

Mr. Fortescue asked what changes had been made to the facility since the stack test that had been performed in November 2017. Facility representatives said the only major changes were the addition of an extension to the distilation column, and the three-stage biodiesel purification system had been added to the process. Facility representatives said the addition of the purification system meant that one of the biodiesel dryers was no longer needed and it had been converted to be a glycerin dryer.

Facility representatives said that the improvements made had removed process bottlenecks, in particular, as the biodiesel is now more clean leaving purification, it has reduced the process bottleneck that existed at the biodiesel polishing phase. Facility representatives said this had allowed AGF to be able to increase production flow rates from 35 to 40 gallons per minute up to 80 gallons per minute. Facility representatives said the increase in production capacity had occurred in the 2017-18 timeframe and had increased the facility's annual capacity to approximately 40,000,000 gallons of biodiesel.

Facility representatives said that by adding a second glycerin dryer, AGF has been able to reduce the methanol concentration in the glycerin from around 1% to approximately 0.2%.

Facility representatives said AGF had not performed a recalculation of their TRE value as it is not their method of demonstrating compliance with Subpart NNN and Subpart RRR. Facility representatives said they do not know if the vent stream flow rate to the CTO has increased as a result of the changes made to the process.

Mr. Fortescue asked if the operating conditions have changed since the performance testing that was conducted in November 2017. Facility representatives said the distilation column vacuum is currently similar, the feedstock flow rate had increased, the distilation column reflux flow had

increased to 40 gpm, the column top temperature was the same, and the column bottom temperature had increased to between 185 to 190 ºF as a result of the addition of the column extension.

Facility representatives said the CTO is the same one as was tested in 2017.

Facility representatives said that the catalyst for the CTO had not been changed out or tested since the performance test conducted in 2017. Facility representatives said the exit temperature of the flue gas from the CTO has increased since the performance test conducted in 2017. Facility representatives said the company Catalyst Combustion Corporation ("CCC") conducted routine maintenance on the CTO. Facility representatives said the most recent maintenance report from CCC is not yet available. Facility representatives said they believed that AGF is monitoring flow to the CTO in two locations.

Facility representatives said that, on-site, the facility has a 40,000-gallon methanol storage tank, a 17,000-gallon wet glycerin tank, and two sodium methylate storage tanks, one 20,000-gallon tank and a second 17,000-gallon tank.

Facility representatives said AGF leases tank storage in the New Haven Terminal, adjacent to the facility.

Facility Tour:

The group proceeded on a tour of the facility.

The group entered the main building and signed in. Facility representatives said that approximately 90% of the feedstock processed at the facility is either used cooking oil or animal fat. Facility representatives said that AGF performs several ASTM methods on biodiesel samples collected from AGF's biodiesel holding tank. Facility representatives said that after AGF has ensured the product meets the required standard, it is pumped into a final biodiesel holding tank, located in the New Haven Terminal, where it undergoes final QA/QC sampling and analysis, which is performed by an independent party. Facility representatives said that biodiesel is either hauled of-site by trucks or is shipped off-site.

The group proceeded to the Control Room. Facility representatives said AGF uses a Delta V control system to monitor the production process. EPA representatives documented that the control system indicated that the total process flow was 80 gallons per minute, the distilation column vacuum was 8.7 PSI, the distilation column reflux was 40.5 gallons per minute, the distilation column bottom temperature was 174 ºF, and the distilation column top temperature was 125.6 ºF.

Facility representatives directed the group to a programmable logic controller ("PLC") that they said controlled the CTO. EPA representatives documented that the PLC indicated the catalyst inlet temperature was reading between 796 and 801 °F, the catalyst outlet temperature was reading between 886 and 893 °F, the total flow was reading 1751 cubic feet per minute, and the differential pressure measured by sensor PIT-101 was reading 3.00 inches of water.

The group proceeded to the production floor. Mr. Fortescue observed that an internal mezzanine level had been added to the facility. Facility representatives described the production process and indicated what each piece of equipment in the building is used for. Facility representatives indicated that the three-phase biodiesel purification process had been added since the November 2017 performance test.

The group proceeded to an area outside the main building. Facility representatives sad that the water that exits the biodiesel purification process was originally fed into the wet glycerin tank; however, it now goes to the distilation column. The group proceeded up onto the outer mezzanine level where facility representatives pointed out the wet glycerin tank, where pH adjustment is performed, the glycerin mixing tank and the glycerin tricanter. Facility representatives said that AGF is currently able to sell the produced glycerin for between 15 to 20 cents per pound.

Facility representatives pointed out the CTO. Mr. Fortescue documented that a magnehelic monitor labeled FL-201 was reading below zero and had condensation in the meter. Mr. Fortescue documented that a digital meter that appeared to be reading from the same location read 2.86 inches of water.

The group proceeded to the ground level and facility representatives pointed out two process boilers. Facility representatives said the third process boiler is located inside the main building.

The group proceeded to the rear of the main building. Facility representatives pointed out the distilation column and the steam stripper extension. Facility representatives said AGF had to add the steam stripper to deal with the additional water loading that had resulted from adding purification water to the column.

Facility representatives pointed out the location of the condenser. Facility representatives said the headspace of the wet glycerin tank is connected to the vent header that feeds into the condenser. Facility representatives said that the AE reactor, decanters 1 and 2 and several chemical storage tanks are also connected to the vent header that feeds into the condenser.

Facility representatives said that AGF is currently leasing 16 tanks in the New Haven Terminal. Facility representatives said that AGF leases a 3,000,000-gallon biodiesel tank, a 900,000-gallon feedstock tank and 2 methanol storage tanks in the New Haven Terminal.
Facility representatives pointed out a truck loading rack located at the rear of the Facility, that they said had been recently installed. Facility representatives said that the loading rack is used to load trucks with 100% biodiesel and that AGF does not blend biodiesel with diesel.

The group proceeded towards the front of the main building. Facility representatives pointed out an addition to the main building and said it had been recently added. Facility representatives said that AGF is installing a feedstock polishing process mainly to process animal fat feedstock using similar absorbents to those used in the biodiesel polishing process.

Closing Conference:

Mr. Fortescue thanked the facility representatives for their time.

Mr. Fortescue said that based on observations made during the inspection, it appeared that the CTO may not be operating under the same conditions that it was tested at. Mr. Fortescue said that the facility is now operating at approximately double the capacity and that, with the addition of additional equipment such as the purification process, this may have increased the loading to the CTO.

Mr. Fortescue said that the PLC indicated that the total flow through the CTO appeared to be currently at 1751 cfm, while the CTO was tested at 422 cfm. Mr. Fortescue said he acknowledged that it is unclear if the two measurements are for the same flow, as the performance test report is not clear on how this flow was measured; however, he said that the catalyst outlet temperature is also currently higher than the temperature the CTO was tested at in 2017 (currently 886 and 893 ^{o}F versus the tested temperature of 804.3 ^{o}F).

Mr. Fortescue recommended that the facility should verify if the flow to the CTO had increased. Mr. Fortescue also recommended that AGF could consider conducting another performance test and if it is determined that emissions from the CTO had increased, the AGF could consider performing a potential to emit calculation for the new operating conditions.

Mr. Fortescue said it is possible EPA could use its information request authority to gather further information from the facility.